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THE PROPOSED  
FOREST RESERVE ON THE KENAI PENINSULA  
ALASKA

By

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Pursuant to instructions from the Forester of the U. S. Department of Agriculture, an examination of the lands of the Kenai Peninsula was made by the writer, during the months of October and November, with some few extra days in December spent along the line of the railway leading from Seward.

Between Valdez and Seward travel was performed in the small steam launch "Annie" of Ellamar, Capt. James Bettels, owner and pilot.

After a few days spent near Seward, a dory was purchased on Kenai Lake, and the journey to Kenai, on Cook Inlet, made down the Kenai River and lakes in this boat, interrupted by an overland trip to the mining towns of Sunrise and Hope on Turnagain Arm. From Kenai, dory and outfit were taken on the S. S. Tyonic to Seldovia, where a native boy, Alsanti Roman, was employed as guide and packer. The journey to the head of Coal Bay was made in the boat, thence overland to Kussilof Lake and back, with side trips from different points along the shores of Coal Bay.

This itinerary covered all important points of the region except the ocean side of the peninsula from Saldovia to Resurrection Bay, the open sea being too rough at this time of the year to attempt coasting in a small boat along this rock-bound shore.

In the absence of any maps of the interior, except the charts, which are very erroneous as to the interior of the

peninsula, positions were determined as nearly as possible by estimating distance, and by compass bearings, and no great accuracy is claimed for them.

The writer is grateful for the uniform kindness and many considerations and courtesies shown by every one met, especially so to those who extended the hospitality of home and camp in true frontier style.

#### Geography

The Kenai Peninsula is an elongated area of land lying in a general northeast and southwest direction, almost surrounded by the waters of Prince William Sound, the Pacific Ocean, Cook Inlet, and Turnagain Arm. It is situated between the 59th and 61st degrees of north latitude and the 148th and 152nd degrees of west longitude, and is 152 miles long, its greatest width being 118 miles, with an approximate area of 6,463 square miles, or 4,136,320 acres.

The word Kenai is the Russian term for summer land, and in the early history of their occupancy it was a well-populated region, rich in furs, abounding in game, and its waters teeming with salmon and other fish; its tolerable climate and system of penetrating waterways offering many inducements to these early explorers, which were utilized to the utmost.

The principal of these waterways are Coal Bay, Kussilof River and Lake, the Kenai River and Lakes, and Turnagain Arm,

which almost severs the peninsula from the main land, and is noted for its extremely high tides, which rise over 45 feet.

The Kenai lakes, with the connecting rivers, nearly cross the peninsula in its widest part, being easily passable for small boats going down, but difficult of ascent, owing to the swift, rocky rapids, which are frequent. The Kussilof River is short and swift above tidewater, the lake an admirable sheet of water 30 miles long, reaching across the plateau land to the foot of the mountains.

Kachemak and Coal Bays are a deep indentation from Cook Inlet on the southwest end of the peninsula, while on the ocean side is a series of bays and harbors extending into and around the shores of Prince William Sound.

Resurrection Bay is the most important of these, being the terminus of the projected railway to the Yukon and other valleys of the interior; the others are little known, except Port Wells, noted for its large and numerous glaciers.

#### Topography.

In a general way the peninsula can be divided into two distinct topographic regions, the easterly, entirely mountainous, the western, and uneven plateau of varying elevations.

The mountainous portion is the greater, made up of a range of extremely rugged mountains, from 3,000 to 6,000 feet in altitude, the valleys for the most part ice-filled to a general elevation of 2,000 to 4,000 feet, the ice uniting in a compact body, with its tentacle-like arms spreading in every direction, large and more numerous on the coast side, where nearly every embayment

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Valley to Turnagain Arm, drained by the Chicaloon River and locally known as the Chicaloon Flats, a noted moose range.

This entire plateau, high and low, is an area of good, loamy soil, deep enough to be of value as agricultural land. Most of the lower, dry portions along the edges of the actual streams valleys, is well drained, easily cleared, fertile, and will no doubt be a farming and grazing region of some importance in the distant future.

#### Forests.

The Kenai Peninsula, possessed of such an interestingly diversified topography, of such climatic differences, and of such a variety of latent resources, has a no less heterogeneous forest growth, which combines every class of Alaskan forest, with the exception of only four conifers, namely, the fir, Abies amabilis (?) the red cedar, Thuja plicata, the black pine, Pinus contorta, and the yellow cedar, Chamaecyparis nootkatensis, the latter found in Prince William Sound.

Fringing the steep, rocky shores of the many embayments of Prince William Sound and the open ocean coast, is a type of generally poor forest, in many places withered and blasted by the sweep of winds from the nearby glaciers, struggling to attain the size and dignity of threes adapted to the uses of mankind, but succeeding only in the sheltered depressions and ravines, and around the coves, where a somewhat greater accumulation of organic

soil has fostered their growth, a small part of what is at most a very restricted area for so great an extent of territory. Along the shores of Port Wells and its system of deep fiords, there is no commercial timber at all. The forests are made up of Sitka spruce, Picea sitchensis, coast hemlock, Tsuga heterophylla, and alchok\*, Tsuga mertensiana, the latter the dominant tree. Viewed from a distance these slopes present a dense, well-forested appearance, but when examined the trees prove to be stunted and depressed, offering no inducements to lumbermen. Occasional areas of from 50 to 100 acres of a better class are found, with 30 to 40 per cent of the growth spruce, some of these trees 36 inches in diameter and 120 to 130 feet high, but the usual run of the best spruce is from 16 to 24 inches, with 2 to 4 logs in a tree, few with even one log clear. These better areas are so scattered that, classed as a whole, the forest is little better than a good woodland type, in its yield of saw timber, but with a quality suitable for ties, short piling, etc.

The timber line as affected by exposure varies from an elevation of 300 feet in the gulches back from the beach line to over 1,450 feet on the slopes facing the Sound waters, where exposed to the southerly winds.

To the westward of Port Moll Juan (locally known as Kings Bay) there is a gradual improvement in the forest character with a decrease in numbers, size, and quality of the coast hemlock, which ceases entirely at Port Rainbridge, none being found west

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\* The Alut name of this tree used locally by whites.

of Cape Puget, where the spruce becomes the dominant tree along the lower levels, the alchek most numerous in the upper zone, but common on all exposed places near sea level.

Days Harbor is the first bay on the mainland coast which has any extent of commercial forest, some very good spruce suitable for lumber of any kind growing in the gulches and on the slopes along its shores.

As before stated, no examination was made of the coast from Resurrection Bay to Kachemak Bay, but it is known to be a rough, rugged shore with very little forest generally, but some good timber is reported around Port Dick, Port Chatham, and Port Graham—locally English Bay—though in the two latter places the Cook Inlet Coal Fields Company failed to find suitable piling for their dock at Homer.

On the shores of Resurrection Bay a good spruce forest is found with an area of overmature, decaying spruce extending up the valley along the line of the railroad, the best of it in the vicinity of Bear Lake, where it is being rapidly cut out for railroad purposes. Following the line of the railroad from this valley, the forest maintains its coastal character, with the Sitka spruce dominant, to Kenai Lake, there gradually merging into the inland or plateau type, denoted by a change in species and a marked deterioration in size and quality of the conifers, the cottonwoods alone maintaining their usual standard of height and diameter. The dominant tree in this new type is the Picea canadensis, with a mixture of alchek, Tsuga mertensiana, cottonwood, Populus balsamifera, quaking aspen, Populus tremuloides, and



birches, Betula papyrifera and Betula occidentalis. The alder is found on the slopes of the mountain valleys and in the vicinity of Turnagain Arm, there down to sea level. The cottonwood grows almost to timber line; some of the largest specimens seen were at an elevation of 1,200 feet. The aspen chooses the southern exposures; while the birches are found everywhere, some of the best groves seen where the timber meets the shrub alder on the west slope of the mountains. Another spruce, Picea mariana, was seen in the swamps of the plateau, especially on the Chicaloon Flats, a small scrubby tree, rarely attaining a diameter of 6 inches, a dwarf beside the stunted white spruce.

The peninsula forests attain their greatest elevation on the slopes of the mountain valleys, in a few instances creeping up the shoulder of some mountain unswept by snow-slides, to an altitude of 2,500 feet, the general timber line being from 1,200 to 1,600 feet, but in many places as low as 600. In the white spruce zone a very small portion of the trees are large enough to make 12-inch lumber. The average breasthigh diameter of the best of it is below this, and when the entire area with its quantity of small dwarfed and stunted trees is taken into consideration the amount of 10-inch lumber is small. The miners of the Sunrise District during the past eight years have exploited almost the entire forest area of the Six-Mile and Canyon Creek valleys to obtain lumber for sluice boxes, so infrequent are trees of a suitable diameter.



The entire plateau region has no forest of a really commercial type, but it has not been classed as woodland because of the existence in restricted areas of trees suitable for building material for local use, and they might also be of value in the future for stalls, lagging, trestle timbers, and other mining purposes. Birches form a large part of this plateau forest, but are small in size, rarely over 10 inches, the largest seen being 21 inches, and averaging less than 5 inches. The large ones are, as a rule, decayed in the heart, a shell of sap being practically the only sound wood in the tree and are at present of no use except for wood. On the south slope of Kussilof Lake two willows, Salix alaxensis (?), were seen, one 17 and one 21 inches in diameter, both short-bodied, branching a few feet above the ground, and badly decayed, a very unusual size.

Along both shores of Coal Bay and on the elevated plateau between it and Cook Inlet the forest condition is poor. While there is a fair stand of trees for the region they are practically gone. Along the bay shore 40 to 60 per cent of the older standing trees are dead, and on the high plateau 80 to 100 per cent are dead but still standing, having evidently all died about the same time. They are being succeeded by a new growth seemingly not as thrifty as their predecessors; those of to-day are very limby, short-bodied, and have a rapid taper. This growth has not yet grown to lumber size, the largest being only 12 to 14 inches in diameter, and without care their future is destruction by fire.

The best stands of clean, thrifty birch were seen between the spruce and alder growth, at an elevation of 800 to 1,000 feet

on the divide between Sheep Creek and Kussilof Lake, the absence of fallen logs or forest litter being in pleasing contrast to the tangle of down trees in the spruce forest.

Observations in the plateau region lead to the conclusion that there is a gradual increase in the swamp area, which has been encroaching on the forest for ages, and there is every evidence, indicated by old logs and decayed stumps of large size, that a prehistoric forest of greater proportions once existed, probably destroyed by fire before the Russian occupancy of the region, each succeeding generation diminishing in size and quantity until they are reduced to their present impoverished state, when the new era in the country's history demands the best that is or was, to aid in the upbuilding of a new empire.

The entire forested area aggregates 1,784,203 acres, divided as follows:

	Acres
Timber forest	435,070
Birch	16,815
Woodland	920,114
Burned over	88,947
Mountain grass land	131,044
Marsh	24,701
Barren land	2,519,004

The following are the principal forested localities, with approximate areas and quantities:

Resurrection Bay region. Sitka  
spruce dominant tree; most of lum-  
ber trees old and overmature, af-  
fected in the heart; best lumber  
area on peninsula.

	Acres	Board feet
Spruce, 5 M per acre	60,570	302,850,000
Alchek, 800 feet per acre		48,456,000

Days Harbor. Timber same charac-  
ter as Resurrection Bay; harbor  
open; little chance for rafting  
timber; land nearly all steep;  
12 to 15 million accessible.

Spruce and Alchek, 5 M per acre	8,643	43,215,000
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Cape Puget to Days Harbor.  
Spruce dominant; not accessible;  
steep cliffs; heavy surf.

Spruce, some alchek, 3 M per acre	10,867	32,601,000
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Shores of Prince William Sound.  
Steep ground; alchek dominant;  
some hemlock and spruce; 1,750  
feet per acre.

	80,179	140,313,000
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	Acres	Board feet
Kenai Lake region. Everything over 8 inches counted in white spruce; dominant tree; 2 M per acre	46,656	93,312,000
Turnagain Arm region. Mixed spruce and alchak; 2 M per acre	8,736	17,472,000
Resurrection Creek. Timber poor.		
Spruce and Alchak	24,768	24,768,000
Six-Mile River and Canton Creek. Nearly all spruce. 1 M per acre.	22,464	22,464,000
Quartz Creek. All spruce; poor green timber on sides. 1 M per acre.	6,912	6,912,000
Kenai River and tributaries. Spruce and cottonwood on low land; few alchak on high ground. 1 M per acre.	52,998	52,998,000
Indian River. All spruce; few good trees. 1-1/2 M per acre.	2,880	4,320,000
Southside Kussilof Lake. Spruce; timber small; birch plentiful. 1 M per acre.	43,200	43,200,000

	Acrea	Board feet
Coal Bay. East side; spruce; rough ground; 30 to 40 per cent dead. 1 M per acre.	17,730	17,730,000
Anchor Point River. Spruce; fair for region. 1-1/2 M per acre	<u>20,384</u>	<u>30,576,000</u>
Total	481,088	909,270,000
Birch forest 3 to 5 cords per acre.	16,815	67,260,000
Woodland. Mixed birch, aspen, and spruce forest suitable for wood and small mining timbers 750 feet per acre	920,114	690,086,000

Merchantable Timber.

The term, merchantable timber, susceptible of so many different applications, is here used to designate forest areas producing timber suitable for any purpose other than wood, such as the needs of an isolated mining region would demand in the absence of a better quality.

For saw timber, spruce is the tree usually sought, and the standard type of tree desired is far superior to the forest average, resulting in the waste of inferior stuff, in an effort to obtain the quality wanted.

On the shores of Price William Sound there is no quantity of good timber, but small isolated tracts of fair hemlock are found, though too infrequent to be logged as such alone. Westward of the Sound waters, the spruce is of better quality, and there are limited areas such as found in Puget Harbor and Days Harbor, with stands upward of 20 M per acre, but the open waters and a tendant surf almost prohibits its utilization, and the forest growing on the steep, surf-bound cliffs between these bays is not available at all. Resurrection Bay is sheltered, and in summer its timber can be obtained, though its steep sides make logging difficult. West of here, timber is not considered of a quality or in sufficient quantity to be used, until Port Dick is reached, and if the mineral prospects develop, the available supply will probably be utilized on the ground.

The spruce forest body in the valley at the head of Resurrection Bay is the best of the entire peninsula, selected tracts cutting 25 to 35 M per acre suitable for heavy railroad timbers. While the per cent of clear stuff is small, the timber is of a fair average quality. The stand is reduced by defect and poor tracts of second growth to about 5 M per acre as an average.

After crossing the divide and entering the white spruce (Picea canadensis) region, the timber is of value for local use only, there being a very small per cent of the stand large enough to make 12-inch lumber, and the railroad contractors are exploiting the entire Kenai Lake region to obtain ties for the line from the lake to the Arm. The value of the timber in this region is due to the need of it for future mining operations, for which

much can be used that is not of value for any other purpose.

#### Undergrowth

The undergrowth of the region is of no importance as a protection to the soil, and has no economic value in its relation to the resources of the region or to the forest growth. The tree willows, shrub alders, etc., have a future value as wood, and are now used to some extent.

Following is a list of the shrubs and undergrowth of the region in the order of their importance:

Shrub alder	<u>Alnus sinuata</u>
Tree alder	<u>Alnus (?)</u>
Tree willow	<u>Salix alaxensis</u>
Tree willow	<u>Salix sitchensis (?)</u>
Shrub willow	<u>Salix barclayi</u>
Devil's club	<u>Toxinodanax honioidum</u>
Red elder	<u>Sambucus rubens</u>
Highbush cranberry	<u>Viburnum paniciflorum</u>
Salmonberry	<u>Rubus spectabilis</u>
Huckleberry	<u>Vaccinium alaxensis</u>
Blueberry	<u>Vaccinium uliginosum</u>
Mountain ash	<u>Sorbus sambucifolia</u>
Ground juniper	<u>Juniperis communis</u>

In addition to these are many annual and perennial plants which, with the great quantities of grass—a kind of "blue joint" resembling a coarse red top,—grow very rank in the mountains



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and plateau region, particularly so on the high plateau west of Coal Bay. This grass, like the hemlock seedlings of the coast side, quickly succeeds any disturbance of existing conditions, growing especially rank and thick—often over 6 feet in height—in burned areas, like bracken ferns of the Pacific Coast, starting in new burns almost before the ashes are cold. When green in summer it makes an excellent feed for any kind of stock, but in the spring and early summer before the new green grass gets well started, is the cause and origin of many forest fires.

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#### Reproduction

In the coast forests the young hemlock and spruce quickly restock any disturbed forest conditions, and will always maintain themselves to a certain degree of usefulness, but the new growth is not as clean of limbs or so tall as the older one, where seen, usually in the vicinity of an old Indian village where conditions were not the best.

In the mountain sections, where fire is each year encroaching on the forest area, the reproduction of the conifers is almost hopeless. [Between Kenai Lake and Sunrise, the forests are largely burned, and not over 50 spruce seedlings were seen along 40 miles of trail.] Along the Kenai River, in the plateau region, where there is a good soil a few spruce saplings were seen in a burn 14 years old, mixed with a growth of quaking aspen, birch, and willow, but the first growth as a general thing is of the broad-leaved variety, and when this has almost attained its growth

1776  
1904  
14  
1890

then begins the restocking of the spruce, the young trees protected by the short-lived deciduous trees until able to take care of themselves. The forest all indicates that this system has gone on for many years, at least since the Russian occupancy, there being many evidences of their old cuttings restocked in this way.

All the conifers of this region are prolific seeders, many small trees bearing cones which all seem to be productive, and there are usually sufficient seed trees in the burned areas to readily restock them, and, in the plateau region particularly, there is a good soil which should readily promote a forest growth, but for some reason they do not get a start and grow slowly when they do. On the whole the reproducing powers of this forest are not very encouraging, emphasizing the need of care for the existing trees.

#### Fires.

Fire is a serious menace to the forests of the mountain and plateau regions. The fire season begins about May 15 and lasts until August. The first month of this period is the most dangerous, when, as a rule, the skies are clear, with prevailing westerly winds which dry the dead grasses and plants until they are like tinder, and catch fire at the least opportunity, the fire spreading rapidly, killing everything in its way. Between Coal Bay and the Inlet where the grass grows luxuriantly and there are many down trees, fire is particularly dangerous.

In the Hope and Sunrise districts fires have killed

( )  
1904  
most of the much-needed timber. In 1896, the year of the rush to these "diggings," fire swept up Canyon Creek, burning nearly every cabin of the stream and destroying most of the timber. The season was very dry, and the hundreds of men working along the creek, putting in wing dams and doing other work, had accumulated much littler and dead tops, which, when set on fire, through carelessness, resulted disastrously to these forests, and they show no signs of recovering. In the early days, it was thought, and undoubtedly is in part a fact, that forest fires destroyed the mosquitoes which were such an annoyance, and they were set for this purpose, with the result that much of the timber is gone and the mosquitoes mostly there yet.

Fires were sometimes set to clear the rank growth of grass from the mining ditches when being repaired in the spring. These causes, with the usual amount of carelessness, sees each year a new area of burn added to the already proportionally large one.

Much of the plateau region is burned, especially along the Kanai River on both sides. 1904

The extension of the railroad into this fire area, with its accumulation of tops and forest debris along the line, adds a new menace to the living forest, especially with wood-burning engines such as are used now.

The attention of the management of the railroad was called to this fact, and they contemplate the use of spark arresters, which will be a precaution, if not a safeguard.

### Resources and Industries

Like most of Alaska the fisheries and mineral wealth are the present and prospective resources.

Two salmon canneries were in operation on the Cook Inlet shore, but one, located on the Kenai River one mile above its mouth, was burned last spring. The other is located on the mouth of the Kussilof River, owned by the Alaska Packers' Association, having a capacity of 30,000 cases per season. The fish were taken from the Kenai and Kussilof rivers, both prolific salmon streams. Little use is made of the forests by this enterprise, as all of their building and box material, is shipped from San Francisco, Calif. The only native timber used is firewood and trap poles and stakes, several hundred of the latter being cut each season.

- The immense coal deposits of the Coal Bay region are practically undeveloped; the quality of the coal offering little inducement to go on with work now started. The most extensive development work was done on the west end of the Homer Spit. This work was begun in 1894 by the Alaska Coal Company of San Francisco, taken over in 1899 by the Cook Inlet Coal Fields Company of Philadelphia, Pa., and the existing improvements made by them. A dock was built at deep water on the end of the spit, and 7 miles of railroad connect with the mines. The first loads of coal brought to the dock in 1900 are still in the cars, where left on the track at that time. Mr. S. F. Penberthy, the resident manager, was hopeful of a renewal of the work, but this is doubtful, as there is no local market and the quality—a light lignite—

does not warrant shipment.

Coal is also found along the west shore of the bay, and was seen on both sides of Sheep Creek some distance up the valley. It is being exploited near Port Graham, but no extensive work has been done.

Mr. Pemberthy found the timber in the vicinity of Homer too small for cutting into mining timbers suitable for their purpose; the only use it could be put to was for stalls and lassing.

In 1902 the Aurora Gold Mining Company of New York City put up buildings and shipped machinery to Aurora, on the east side of Coal Bay, for the development of a gold-bearing quartz vein, but it was reported valueless by the engineer who experted the property, and the machinery is still on the dock.

Quartz of good assay value has been found around Port Dick, and the discoverers expect to develop a paying mine next season.

Placer gold is found nearly everywhere on the peninsula; abandoned workings and unused hydraulic outfits—the derelicts which mark the scene of wrecked hopes—are frequently found. The only paying placer is in the vicinity of Hope and Sunrise, where gold was first discovered in 1891. A good strike in 1895 caused the stampede to that section in 1896, and active mining has been carried on since. The camp has never been considered rich, the individual miner realizing little more than a "grub-stake" from year to year, but recent hydraulic workings have

produced some gold, the shipments in 1904 being double those of any previous season, promising much better things for the future. Considerable money is being spent for dredgers and hydraulic machinery, the former to work the deep gravel of the stream beds, the latter to develop the benchdiggings which heretofore have been worked but slightly.

Copper ore is being developed on Lynx Creek with uncertain results, and prospects are being developed slowly all over the peninsula, but so far no quartz mine is on a paying basis.

Up to this time work has gone on in a slow way, the peninsula attracting little attention except as a game region, being considered out of the world and difficult of access. The most important event in its history was the beginning of construction work on the Alaska Central Railway to run from Seward on Resurrection Bay to some point on the Yukon River.

For some time the future of this enterprise was in doubt, but so far as can be ascertained from those interested the building of the road is an assured fact, and every effort will be made to extend the line at least 100 miles next season. The exact route is not yet determined, surveying parties being in the field at the present time, selecting the most feasible route to and beyond Turnagain Arm, where some engineering difficulties will have to be overcome. The proposed route will lead up the Matanuska Valley, tapping the valuable deposits of hard, bituminous coal known to exist there, and then is to be extended to the Tanana, where the recent placer discoveries are attracting hundreds of miners.

The construction of this railroad is drawing heavily on the timber resources of the land contiguous to its line, saw timber being taken from homesteads, placer claims, and all private holdings, without consent of the claimants and in spite of their protests. It is the company's intention to cut timber at the present mill site to be transported 50 miles, before the mill will be moved. If it is found necessary to build snow sheds on Turnagain Arm, the demand for timber for this work will affect the supply available for the miners on the adjacent creeks.

The establishment of this all-American railroad to the interior of Alaska through the most resourceful of all of its territory will undoubtedly be the cause of a considerable influx of people, who will develop the latent wealth of the country in what is now a veritable wilderness just awakening to a realization of its possibilities.

#### Lumbering.

Until the past year very little lumbering has been done on the peninsula, and this was in connection with some mining enterprise. Previous to this time the miners and others using lumber whipsawed what they needed. The miners cut their supply in the idle season, costing about \$50 per M delivered. Whipsawyers were paid \$4 per day each, two men cutting from 200 to 300 feet per day. In the Turnagain Arm region, trees suitable for 10 and 12 tapered sluice bottoms were not readily found, few trees cutting more than 2 logs, and many only one suitable for this purpose.



The Coast Range Mining Company of Hope, working on a quartz prospect, operating in connection with the Palmer Creek Mining Company, and the Bear Creek Mining Company, working placer ground in that vicinity, have a steam mill with a cutting capacity of 10 M per day, but owing to the small size of the timber, the output averaged from 6 to 8 M per day for the first season, when 300 M was cut in a 6-weeks run, beginning in July, 1904. Of the amount Mr. Buzard, the acting superintendent of the property, stated that a very little over 4 M, or only 13-1/2 per cent, made 12-inch lumber; the most of it cut into 1-1/2 x 8, 12 feet long. Anything that would work into a 2 x 6 was cut, and by using a gang edger everything possible was gotten out of the logs 12 feet long, running 10 to 12 per M. The trees yielding two and sometimes three logs, often only one. Alchek is largely cut, and Mr. Buzard thinks that for mining purposes it is superior to the spruce, being clearer and stronger.

The mill wages are the same as paid to miners, \$3 per day and board. The logging done by this company last winter was the first winter wage working ever done in the camp. The loggers were paid \$1.65 per day, working time, horses being used to haul the logs. Mr. Buzard had no estimate of the cost of the logs at the mill. The timber was cut on their Bear Creek placer ground, yielding from 2 to 3 M per acre of spruce and 1 to 2 M of alchek in the best bodies of it.

Mr. C. F. Carter, superintendent of the Rainbow Creek Mining Company, who is also superintendent of the construction of a \$75,000

dredging plant to be operated on Palmer Creek, stated that his company was putting in a small steam mill on Rainbow Creek on the north side of the Arm, opposite Hops, to cut lumber for their hydraulic plant on that stream.

The mill has cutting capacity of 20 M per day, lumber to be cut on the company's placer holdings for their own use.

A so-called sawmill was reported on Bertha Creek. It is a whipsaw run by water power, with a capacity of 400 feet per day, the owner having a contract to furnish M. P. White, a mine operator in that vicinity, with 14 M of flume material for season of 1905.

The Cook Inlet Coal Fields Company of Homer put up a small mill with a capacity of 3 to 4 M per day, and cut about 20 M, then shut down, the product being too small for mining purposes and costing more than Puget Sound lumber delivered on their dock. The excessive cost was due to the expense of getting out sound logs of a size suitable for their purpose. Mr. Pemberthy stated that if operations were resumed all their lumber and piling would be imported from Seattle, as the material obtained locally costs too much and is not up to the standard required for such work except for stalls and lagging.

A small mill was put up on Kenai Lake in 1900, but the Kenai Lake Mining Company who built it quit work soon after it started, and nothing was ever done with it. A small mill was put up on Indian River near the head of Kussilof Lake last year to cut mining material, but it never cut anything to speak of.

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The most extensive lumber cutting on the peninsula is being done by the Alaska Central Railway Company's mill, now located in the Bear Lake Valley about 6 miles from Seward.

This mill was first erected on the Seward Townsite, and started running September 15, 1903, cutting 4 to 5 M per day, until March 1904, when the cut was increased to 7 M per day, sawing railroad timbers with some commercial lumber worked off of the logs in slabbing them to a requisite size for railroad purposes. In July of this year the mill was moved to its present location and the lumber cutting stopped, the demand for trestle timbers crowding the mill to its greatest capacity. The cut now averages about 13 M per day, a shameful amount of waste being slabbed off of the logs to be burned.

Logging is done by contract at \$4 per M, Scribner Scale, the railway company furnishing the engine and cable. Logging was being done about 1-1/2 miles from the mill, hauling the logs by train, but the new setting is near the mill, and the cutting about half a mile distant. The present contractor, Mr. J. D. Johnston, is working a crew of 13 men at an average wage of \$3.50 per day, putting in about 13 M per day. The ground is even, with a good down grade, 12 inches of dry snow making ideal logging conditions. The uneven growth of the timber necessitates frequent moves, from 200 to 500 M being obtained at a setting. The best timber yields 25 to 30 trees per acre suitable for their purpose, averaging about 1,000 feet per tree, cutting from two to five 16-foot logs.

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The settlers along the railroad have strongly protested against the company taking timber from their homesteads, but to no avail, and the U. S. Commissioner at Seward advised them that they had no redress in the matter. Mr. A. W. Swanitz, Chief Engineer and Manager of the Alaska Central Railway, stated that they were advised by the Register of the U. S. Land Office at Juneau that they were privileged to cut on any locations made subsequent to the preliminary location of the railroad line. So far the company have cut between 4,000 and 4,500 M. Of this amount about 100 M was sold to the commissary people and others connected with the railroad. In the first 14 miles of line, 9,200 lineal feet of trestle was put in. The bents are made of round, and the mudsills of hewn timbers.

Mr. Swanitz stated that timber for the first 50 miles of track would be cut at the present mill site, as there was no saw timber in that distance. The next mill site is to be located on the north side of Turnagain Arm, where good timber is again found, then moving to the Matanuska Valley.

A wood-burning locomotive is used which consumes 2-1/2 cords of wood per day, and the electric plant uses 4-1/2 cords, costing \$3 per cord, some being cut by settlers. Mr. Swanitz stated that the average cost of ties was 34 cents, while Mr. P. Young, who is tie inspector, stated that 16 cents was paid for ties piled in the woods, and 20 cents when piled along grade.

The contracts are let to persons cutting on land recorded as homesteads 3-1/2 miles from Seward, the ties for use on terminal grounds near town and anywhere needed.

The Yakutat Lumber Company are shipping lumber from their mills at Yakutat for this market, as well as from their mills at Ballard, Washington.

The following are the prices of lumber per M feet at Seward in October, 1904:

Puget Sound fir, rough	\$25.00
sized	28.00
rustic	35.00
flooring	35.00
dressed	35.00
Yakutat spruce, all kinds	25.00
shingles	3.50 per M

Lumber prices at Sunrise and Hope, October, 1904:

Puget Sound fir, rough, any kind	\$30 to \$40
flooring, etc.	40 to 47.50
Freight on lumber Seattle to Hope	21.00
Spruce wood per cord at Seward	4.50
"    "    "    "    " Sunrise	3.00

#### Settlements

The region is sparsely settled, with few people living outside of the villages.

Seldovia has 15 whites and about 75 or 80 natives. The whites are traders and prospectors, the natives live by hunting and fishing.

Anchor Point has 8 or 10 whites, beach miners, and traders, and a few natives.

Ninilchek was a one-time Russian penal colony; it has about 60 natives.

Kenai is a slightly village of about 200 inhabitants, Russian and native, with a few white men. Hunting and fishing occupations are followed. Natives make a good living.

Hope is a mining town with a winter population of about 100; 200 men on creeks in mining season.

Sunrise is a mining town, winter population 125; 200 or more on creeks in vicinity during mining season.

Along the Kenai River perhaps half a dozen men winter, hunting and trapping, and as many more on Coal Bay and Sheap Creek.

Seward has a resident population of 200. There are several stores and saloons, a hotel, etc., supported by the railroad entirely. The company contemplates the extension of their dock privileges and the construction of machine shops, etc., early next season, which will increase the population materially.

#### Alienated Lands.

The practice—under the fee system—of accepting for record in the recording offices notices of location of both mineral and homestead entries so imperfect in description as to leave it to the imagination of the reader to determine their situation and in some instances the area, makes it extremely difficult to definitely determine the location or amount of alienated lands, and the following are given as best ascertainable from the records:

	Acres
Scrip on Bear Cove, Coal Bay	150
Scrip on Seward Townsite	160
U. S. Agricultural Experiment Station, Kenai	320
Russian Church site, Kenai	20
Russian Church site, Seldovia	..
Cannery site, Kussilof	20
Cannery site, Kenai	..
Store site, Kenai	.7-1/50
32 homestead entries, Kenai	9,894
32 Coal-land entries, Kenai	7,560
340 gold-placer entires	6,800
80 quartz entries	1,650
240 placer-oil entries	31,195
Total	57,769.7

The oil-placer locations were for the most part made in 1903, and they will revert to the Government unless the usual course of relocating them on January 1, 1905, is pursued, as no assessment work has been done. These locations are made in groups of twelve to twenty 150-acre tracts, by the same individuals, resorting to a rearrangement of the names on each new tract.

The largest block of land acquired under the rights of placer-oil locations is by the Alaska Colonization and Development Company, an organization incorporated under the laws of Arizona, the head office, 24 State Street, New York City, ostensibly



for the purpose of establishing a Finnish colony on and about the shores of Coal Bay for the purpose of developing the fisheries, coal, mineral, agricultural, and grazing resources. Mr. E. S. Churchill is the general manager, visiting the company's headquarters at Port Axel—Bear Cove—each summer. Mr. J. A. Carlson is in charge of the property, living on the ground the year round. Soldiers Additional Homestead Scrip was used to obtain title to four parcels of land aggregating 150 acres on Bear Cove, which is subdivided into town lots, a rough, uneven tract useless for any purpose. Mr. Churchill has a homestead of 217.2 acres located which he visits yearly, and the company has seven 160-acre tracts of gold placer surveyed and recorded where there is no gravel, and on the opposite side of Coal Bay, along Fox River and up Sheep Creek, they have surveyed 74 claims, 46 of which are on record. Some development work has been done on some coal lands near Fox River, and 8 miles of wagon road have been cut up Sheep Creek for assessment work on the oil land. On paper they have a proposed railroad from Bear Cove to Fox River; the evident purpose is stock jobbing and would bear investigation.

The other extensive placer-oil locations are made by different parties claiming six to twenty 160-acre tracts, using eight or ten names, the locations made by one or two persons as agents for the others. These oil claims cover much of the forest land of the vicinity, and are located for speculative purposes only, there being no oil rigs or development work of any kind.

missing  
32.33

than Hope and Sunrise, with an equal amount of precipitation.

The rain-laden winds are from the south to southeast, at times furious gales along the coast. Southwest to northwest winds on the Inlet side are dry and frequently cold. The prevailing winter winds are from the north, blowing very cold when sweeping across the glaciated mountains.

Very little snow falls in the vicinity of Seldovia, and the thermometer rarely reaches zero. Seward is apt to have 4 to 6 feet of snow, 8 or 10 degrees below zero a minimum, with frequent rains on the coast all winter. Sunrise and Hope have 12 inches of snow on an average; 45 to 50 below zero is not uncommon in winter. Kenai Lake and river valleys have 18 to 30 inches of snow, the temperature down to 40 below.

### Agriculture

Representing as it does one of the earliest settled portions of Alaska and possessing, on its Cook Inlet side particularly, a climate which compares favorably with that of northern New England, it seems remarkable if the region was adapted to agricultural pursuits that this industry should not have been developed to some extent at least. The early Russian settlers made attempts at gardening, and the natives have followed this practice for many years, cultivating small gardens but not producing sufficient to maintain themselves.

Garden crops of the hardier sorts do well; the potatoes grown here are watery, and have a "sweetish" taste similar to that of a frozen one; grains will not mature, but produce an excellent straw for hay, which it is difficult to cure because of the cloudy, rainy weather which prevails during the haying season. The entire region is subject to early and late frosts, which are detrimental to vegetable growth, and even in the sheltered mountain valleys the nights are cool.

The cost of clearing and breaking farm land on the experimental station farm at Kenai was \$60 per acre, where there was a second-growth forest with few trees of any size. In the vicinity of Skalahk Lake and along the banks of the Kenai River for some distance below the lake, there is a burned-over area of apparently good soil which lies fairly level, offering the best opportunity for agriculture of any place on the peninsula, but its isolation will prohibit its occupancy for many years to come

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With due deference to the opinion of those who are enthusiastic over the agricultural possibilities of this region, the writer fails to see where the opportunity offers. There are many men living in Alaska who make it their home from year to year, who are acquainted with its resources, who believe in its future and are willing to engage in any enterprise, especially farming, if it promised to be even moderately lucrative, but the fact remains that none are attempting it as a business, and few as an experiment. A farmer can not live without a market, and until the mineral wealth of the country is developed sufficiently to create one, few will attempt to eke out an existence wrought from the soil amid these ice-laden hills, whose chill is fatal to their enterprise.

#### Grazing

The grazing resource of the region, like its agricultural, is not sufficiently developed to demonstrate its possibilities.

A few cattle are kept on the experimental farm at Kenai which are fed about five months of the year, and a few are owned by the natives there, which get very fat in the summer season and seem to do fairly well without much feed in the winter, but spring finds them very poor. Horses and cattle both nearly maintain themselves on the Homer Spit, supported by a nutritious salt grass, growing on the open spit where the snow is swept clean nearly all winter and the grass starts early in the spring. These animals rarely go into the hills to feed, even when the early

grass is at its best. Insects are very troublesome in the summer, but stock which becomes acclimated seems to thrive in spite of them.

Like farming, this industry is entirely in the future, awaiting a market to develop it.

#### Game

The Kenai Peninsula has the distinction of being the home of the largest moose, and has some of the largest and fiercest bears known to the world; and the rock-ribbed, ice-bound fastness of its mountains are the home of the mountain sheep, whose pursuit amid the crags, declivities, and emerald vales in the high elevations of scenic mountains is the most fascinating of hunting sports. A very few caribou are known to still exist in the vicinity of Caribou Mountain, at one time the home of immense bands, now nearly extinct. Brown and black bears frequent the stream valleys; porcupines and rabbits are numerous; the spruce grouse is very common; ptarmigan abound above timber line, and waterfowl are very plentiful in the Chicaloon Flats region. Fur-bearing animals are quite plentiful, and are a considerable source of revenue to the natives.

The general range of the moose is coincident with that of the white spruce (P. canadensis), but a few have strayed across the low pass and have been killed near Resurrection Bay. They are most numerous in the region between Coal Bay and the Inlet, where the range conditions are almost ideal, made up of ample forest and brush cover, with sufficient ponds and open ground above

timber line to afford an opportunity for escaping insect pests in the summer. This territory also includes the range of the remaining half dozen caribou. The Chicooloon Flats is another favorite moose range, not much hunted.

The best sheep ranges are on the west slopes of Sheep Creek, no one knowing how far they penetrate the range, but probably no great distance. About the glacier at the head of Skalahak Lake is another favorite haunt, and some think the largest band range the mountains on the east side of Kenai Lake between Vickery Creek and Snow River. They formerly kept to the lake slopes, but the continued blasting on the railroad and the increased number of hunters have driven them back to the head of Snow River. Most of the sheep on the peninsula are in these three localities.

Outside of the mining districts, the furs and game have been a source of livelihood for all the natives and many of the whites of the Cook Inlet region. The issuance of permits for the killing of game by trophy hunters was the means of bringing a number of people to the peninsula each year, who employed guides and packers and spent a liberal amount of money in any community they were in. Mr. Geo. S. Mearns, the storekeeper at Kenai, estimated that stopping the issue of permits meant a loss of \$4,000 to the natives of that place, and the Seldovia natives also felt the loss of this trade, and incidentally the traders did also.

There is no question of the abuse of permits, as many hunters allow too short a time to obtain their trophies, and kill all good specimens, taking away the best. As a remedy for this evil Mr. Mearns suggested that trustworthy guides be licensed,

and Mr. Pemberthy, of Homer, has proposed that permits be recorded and a certified copy be posted at the point of arrival and departure of the hunter, and a copy also be posted in the party's main camp. The citizens are jealous of the permit system, and would readily report any abuse of permits if they knew the privileges granted.

Few, if any, of the white men of the region wantonly slaughter game, and little, if any, that they kill goes to waste.

The Indians, to whom the game means so much, are the only wanton destroyers, and so strong is the inherent blood lust within them that they are unable to resist the temptation to kill when chance affords. Another evil is the practice of traders grub-staking natives to hunt heads, one case coming to notice where three large heads were said to have been gotten in this way this season.

The natives aver that twenty years ago there were no moose on the peninsula at all, and that they were most numerous about seven years ago, when the large influx of white men took place. There is a variance of opinion as to the number found now. Some who have lived here since 1897 think there are more, others say less, but they are still fairly numerous, and a consensus of opinion seems to be that they are maintaining themselves, but care should be taken to prevent their destruction by strict enforcement of the game laws, and if necessary the placing of a bounty on wolves, which all old timers concede kept them down in the early days.



### Sentiment

The "old-timers" fear a curtailment of time-honored frontier privileges by the creation of a forest reserve, but realize the necessity of timber preservation and the prevention of fires as it affects their future welfare. Part of the element which has followed the railroad are mostly transients, who are indifferent to anything affecting the general welfare of the country; others are looking to the immediate present and the spoliation of anything that offers immediate recompense, and condemn any movement which would hinder their purpose, without a thought of the future. A few realize the intent and purpose of the movement, and heartily support it, but the majority are entirely indifferent.

### Conclusions and Recommendations.

In a region so remote from the centers of civilization, its resources undeveloped, its inhabitants scattered throughout an almost untrammelled wilderness, wrestling with untoward circumstances, in an effort to reduce to the needs of mankind a land which offers so little and demands so much, the question of creating a forest reserve does not present the arguments usually brought up where the preservation of watersheds and the conservation of the water supply is so vital to the interests of all the people, and it seems a far-fetched idea to seriously contemplate forest preservation where there is so little apparent need of it and so little to preserve.

Here the living forest, though small in size, the product of many years growth, which when destroyed does not seem to thrive under the civilizing hand of mankind, and so slow is this growth that the seedlings of today will be of little use at the end of this century. There is relatively small area of timber forest, every foot of which will sometime be needed. The forest cover in its primal state is also very essential to the prolonged existence of the living game, which represents the best types of its kind and, if cared for, will be a source of revenue to the inhabitants and pleasure to the world for many years to come.

There is a distant future before this region when the people will need every bit of forest product, and the preservation of the forest, for its forest worth, in behalf of those to come, is the most that can be said for it, and in consideration of this and the other circumstances mentioned I have the honor to recommend the creation of the Kenai Forest Reserve, ot wit: Beginning at the most westerly point on the shore line of Portage Bay; thence along the southerly shore line of said bay to the shore line of Prince William Sound; thence following the general mainland shore line of said sound, in a southerly direction, to Cape Puget; thence continuing in a general southwesterly direction, along the general mainland shore line of the Pacific Ocean, to the most southerly point of the mainland shore line; thence westerly to midchannel in Cook Inlet; thence northerly up midchannel in said inlet to a point opposite the midchannel line of Turnagain Arm; thence easterly up this midchannel line to the most easterly point on the short line of said arm; thence easterly across the "Portage" to the most westerly point on the

shore line of Portage Bay, the place of beginning. And it is further recommended that laws be enacted for preventing the alienation of large tracts of the public timber lands, under the guise of the placer laws, by power of attorney. And it is further recommended that certain portions of the area included in the bounds of the recommended Kenai Forest Reserve be made game preserves, for the perpetuation of the game species of the region, one to be located so as to include a favored habitat and breeding ground of the mountain sheep (Ovis dalli Kenaienses), another to include the year round haunts of the moose (Alce americanus gigas), and the range of the few remaining caribou (Rangifer granti). For the first I would respectfully suggest an area to include the headwaters of both branches of Sheep Creek, extending 10 miles in an easterly direction from timber line on the east side of the Sheep Creek Valley; for the second I would suggest an area 20 miles long by 13 miles wide, the center of its northern end about opposite the T spit, one mile south from the shore line of Kussilof Lake, to include the Caribou Mountains.

#### Administration.

The few interests to be conserved in this comparatively large area do not demand the usual number of patrols in a reserve of this size. The fire control must be largely by the moral support of the residents, its necessity impressed by the presence of a few Rangers. Except in the mining region, which is largely burned, there is nowhere sufficient people to cope with a forest

fire once under way in the dry grass and moss.

There will be few timber sales at present, and these in the mining region of Turnagain Arm and in the vicinity of Seward.

For the present, the needed rangers, working under the direction of a general supervisor for Alaskan reserves, would be located as follows:

Ranger in charge located at Kenai Lake, covering region from Seward to Skalahk Lake, service the year round, travel on lake and rivers by canoe. Turnagain Arm watershed, headquarters at Sunrise, service 12 months, one ranger, travel on foot.

Game region of Kussilof Lake from head of Sheep Creek to Skalahk Lake, headquarters at Kelly's sawmill, Kussilof Lake, post office Kenai, service May 1 to August 15, one ranger, travel by canoe on lake, on foot across country.

Coal Bay region, head of bay to Anchor Point, headquarters at Homer, service from May 1 to August 15, one ranger, travel by dory on bay, on foot inland.

Saw timber of good quality should be charged for at the rate of \$1.50 per M board feet.

Ties	\$.02-1/2 each
Mining timbers	.50 per M bd ft.
Piling	.01 per lineal foot
Green spruce wood	.25 per cord
Dry spruce wood	.12-1/2 per cord
Green birch or alder wood	.12-1/2 per cord

These prices are applicable where there are communities of size, with liberal construction of free-use privileges to individuals where isolated and attempting the development of the country.